USSR UDC: 612.014.421.8:621.317.727.1

BERSENEV, M. S., LUKOSHKOVA, Ye. V., and KHAYUTIN, V. M., Laboratory of Blood Circulation Regulation and Biophysics Institute of Normal and Pathological Physiology, USSR Academy of Medical Sciences, and Laboratory of Automated Systems for Diagnosis of the All-Union Scientific Research Institute of Medical Instrument Building Ministry of the Medical Industry, USSR, Moscow

"Using the Potentialoscope to Detect Weak Bioelectrical Signals by the Coherent Storage Method"

Moscow, Byulleten' eksperimental'noy biologii i meditsiny, No 8, 1972, pp 115-117

Translation:

A device used for detecting bioelectrical signals in noise of biological and instrumental origin, operating on the principle of coherent storage, is described. A cathode-ray tube with charge storage (the potentialoscope LK-8) is used as the memory device.

At the present time, specialized digital computers (SDC) such as the CAT-400, ART-1000, ATAC-20, ANOPS-1, and "Neuron" are used in the analysis of bioelectrical signals. One of the problems these machines solve best is the detection of weak bioelectrical signals and the averaging of the evoked responses by the

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BERSENEV, M. S., et al., Byulleten' eksperimental'noy biologii i meditsiny, No 8, 1972, pp 115-117

method of coherent storage /3/. However, the widespread use of SDC is limited due to their complexity and high cost. This, in turn, hinders the use of the SDC directly in the course of the experimentation and, consequently, in the determination of further experimental tactics in accordance with the results.

In this connection, it has become urgent to develop small analog analyzers for direct use during experiments. The special cathode-ray tube, the potentialoscope, may be used for this purpose /4/. This tube is capable of holding information for a long time and can therefore be used as an operative storage device.

The potentialoscope consists of a system of electrodes designed to form an electron beam and control its scanning over a signal plate covered by a fine dielectric layer (the target) and a barrier grid. If a varying potential is applied to the signal plate while the electron beam is simultaneously scanned, the potential at each point of the target is determined by the signal plate potential at the moment the electron beam passes through

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that point. As a result, a so-called potential relief, capable of being stored for a long time, is formed on the target /5/. The barrier grid reduces interaction of adjoining sections of the target and thus prevents blurring of the potential relief.

The LN-8 potentialoscope is used in the instrument we developed. Research /2/ has shown that, when properly operated, the LN-8 provides a linear relationship between the recorded and input signals with changes in the recorded signal amplitude of 10 to 60 V. This characteristic makes possible an undistorted reproduction of the amplitude characteristics of the signal to be investigated within broad limits.

The functional block diagram of the instrument is shown in Fig. 1. Potentials derived from the nerves, brain, or muscles, pass through the recording amplifier, and are applied to the signal plate of the potentialoscope. The travel of the electron beam along the horizontal is realized by a scanning block in synchronism with the stimulator pulse applied to the object of the investigation. The responses to a single stimulus are arranged along each line. After the line is scanned, the beam reads across the

BERSENEV, M. S.,et al., Byulleten' eksperimental'noy biologii i meditsiny, No 8, 1972, pp 115-117

next line. In accord with the coherence condition, the responses in the lines are arranged one underneath the other, and a potential relief is formed on the target which represents a function of three variables: the biopotential amplitudes (the potential of a given point on the target, the Z axis); the time from the moment of the stimulus (the X axis); the number of the line (the Y axis). For the readings, a sinusoidal voltage (the reading voltage) whose frequency exceeds the band pass of the reading amplifier is applied to the vertical deflecting plates of the potentialoscope. The electron beam, spread by this varying voltage in the vertical direction over the whole target, passes once over the target in the direction of the time axis with a velocity equal to the scanning velocity in recording. With a sufficiently high reading voltage frequency, the electron beam will pass relatively quickly over the target in the transverse direction, successively producing in each discrete vertical line the algebraic sum of the potentials in the lines /1/. Thus, the statistically probable

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bioelectric signals are realized in the reading at the load resistance in the form of the averaged response, fixed by an oscillograph with photographic recording. As a random process, the noise is converted at the output of the instrument into a null or the d-c component of the output signal, depending on its distribution law.

Figure 2 shows the composite potential of the C fiber action obtained from the intact (no fibers removed) cord of the tibial nerve, recorded directly after the amplifier (Fig. 2A), and after averaging 150 responses by the potentialoscope (Fig. 2B). In recording A, the original signal/noise ratio may be approximated at 1:3, while in recording B, after averaging, it is 4:1. As a result of the averaging, then, the signal/noise ratio increases 12 times. The obtained experimental data confirms that the increase in the signal/noise ratio by using this instrument is subject to the $\sqrt{n}$ law, where n is the number of averaged responses. If weaker signals are to be detected, the number of averaged responses may be increased by increasing the memory capacity of the instrument with two or more potentialoscopes.

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BERSENEV, M. S., et al., Byulleten' eksperimental'noy biologii i meditsiny, No 8, 1972, pp 115-117

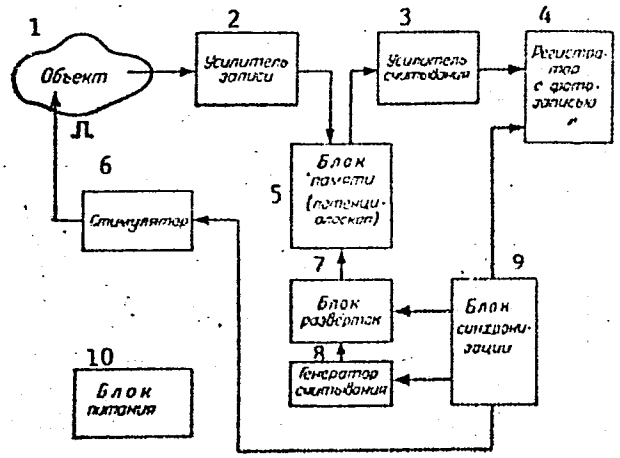

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Fig. 1. Functional Block Diagram of the Instrument; Explanation given in the text.

(Key: 1) Object; 2) Recording amplifier; 3) Reading amplifier; 4) Recorder, with photographic recording; 5) Memory block (potentialoscope); 6) Stimulator; 7) Scanning block; 8) Reading Oscillator; 9) Synchronism block; 10) Power supply)

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BERSENEV, M. S., et al., Byulleten' eksperimental'noy biologii i meditsiny, No 8, 1972, pp 115-117

Fig. 2. Composite Potential of the Action of Slowly Conducting Fibers of a Cat's Tibial Nerve Before (A) and After (B) Averaging.

The distance between the stimulating and outlet electrodes is 82 mm. The calibration is 5μV (for A), 20μs (for A and B).

USSR

BERSENEV, M. S., et al., Byulleten' eksperimental'noy biologii i meditsiny, No 8, 1972, pp 115-117

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2. Bersenev, M. S. and Gundarov, V. P., Novosti med. priborostroyeniya (Medical Instrument Design News) Moscow, No 2, 1971, p 34.

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8/8

USSR

UDC: 528.526.6

LAVROV, V. N., ZHITOMIRSKIY, I. B., LUKOVATYY, Yu. S., YAKOVLEVA, N. P., VASIL'YEV, Yu. F., All-Union Scientific Research Institute of Mining Geomechanics and Surveying

"A Miniaturized Surveyor's Gyrocompass"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 9, Mar 72, Author's Certificate No 331253, Division G, filed 21 Jul 67, published 7 Mar 72, p 117

Translation: This Author's Certificate introduces a miniaturized surveyor's gyrocompass which contains a theodolite with autocollimation system, a trigger and a gyro attachment with pendulum sensing element on a torsion suspension and strip current feed. As a distinguishing feature of the patent, the design provides for compensation of the torque of the torsion suspension and the current feed. The current feed is made in the form of strips bent in the vertical or horizontal plane with their ends fastened to the sensing element at a distance r from its axis of rotation, where r is defined by the formula

$$r=aD\left(\frac{\sqrt{DK}}{JE}+b-c\right),$$

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LAVROV, V. N. et al., USSR Author's Certificate No 331253

where D is the distance between the fixed ends of the current feed strips, K is the stiffness of the torsion suspension, a, b and c are numerical coefficients which depend on the shape of the bend in the strips, and IE is the rigidity of the current feed strips.

USSR UDC 531.383

LUKOVATYY, Yu. S.

"Accelerated Aperiodic Adjustment of a Terrestrial Gyrocompass"

Priborostroyeniye, No 12, 1971, pp 69-72.

ABSTRACT: Methods are known for accelerated adjustment of a gyrocompass to the meridian, requiring application of external control torque to the sensing element. This article studies the possibility of accelerated adjustment of a terrestrial pendulum gyrocompass using the inertial torque developed when the rotor is accelerated. The use of the inertial torque developing upon acceleration of the rotor of a gyrocompass allows accelerated aperiodic adjustment to the meridian to be performed. The rule of change of the kinetic moment with time H = H(t) providing aperiodic adjustment to the meridian is independent of the initial deviation of the sensing element from the plane of the meridian.

1/1

1/3 : 020 UNCLASSIFIED PROCESSING DATE--09OCT70
TITLE--FIRST TESTS OF ELECTROCHEMICAL SEISMIC DETECTORS -U-

AUTHOR-(04)-GALPERIN, YE.I., GRAFOV, B.M., LUKOVETS, P.O., NOVITSKIY, M.A.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, IZVESTIYA AKADEMII NAUK SSSR, FIZIKA ZEMLI, NO 2, 1970, PP 81-87
DATE PUBLISHED--------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--SEISMOLOGIC INSTRUMENT, OSCILLATION, ELECTROCHEMICAL PROPERTY, BOREHOLE, SEISMIC SOUNDING, SEISMIC REFLECTION, SEISMIC REFRACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1991/0729 STEP NO--UR/0387/70/000/002/0081/0087

CIRC ACCESSION NO--AP0110456

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002201820020-4"

2/3 020 UNCLASSIFIED PROCESSING DATE--090CT70

CIRC ACCESSION NO--AP0110456

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SINCE THE SPRING OF 1965 THE INSTITUTE OF PHYSICS OF THE EARTH AND INSTITUTE OF ELECTROCHEMISTRY HAVE ENGAGED IN JOINT EXPERIMENTAL WORK FOR EVALUATING THE POSSIBILITIES OF USING ELECTROCHEMICAL CONVERTERS FOR REGISTERING SEISMIC OSICLLATIONS. IT IS EMPHASIZED THAT ONLY THE FIRST STEPS IN THIS DIRECTION HAVE BEEN TAKEN, ALTHOUGH THE POSSIBILITIES ARE CLEAR. THE ELECTROCHEMICAL SEISMIC DETECTOR HAS A SOLID HOUSING WHICH HOLDS A SENSING ELEMENT, CONSTITUTING AN ELECTROCHEMICAL CONVERTER. IT CONSISTS OF A CYLINDRICAL PLASTIC CONTAINER TO WHOSE OPPOSITE SIDES ELASTIC MEMBRANES ARE ATTACHED. WITHIN THE SENSOR THERE IS A PARTITION WITH AN OPENING WHICH DIVIDES IT INTO TWO CHAMBERS. THE SENSOR IS FILLED WITH AN ELECTROLYTE WHICH TOGETHER WITH THE MEMBRANE AND THE CHANNEL FORMS A MECHANICAL OSCILLATORY SYSTEM. PLATINUM GRID ELECTRODES ARE INSERTED IN THE CHANNEL. THE ELECTRODES TOGETHER WITH THE ELECTROLYTE CONSTITUTE A REDOX SYSTEM. THE ELECTROCHEMICAL SEISMIC DETECTOR USED IN THE EXPERIMENTS IS A CYLINDER 40 MM IN LENGTH AND 30 MM IN DIAMETER AND WEIGHS ABOUT 70 G. THE SENSOR IS PARAMETRIC. IN THE ABSENCE OF A USEFUL SIGNAL A D-C CURRENT FLOWS THROUGH IT. WITH THE APPEARANCE OF FORCED OSCILLATIONS THE SENSOR HOUSING TOGETHER WITH THE ELECTRODES OSCILLATES RELATIVE TO THE FLUID IN THE CHANNEL AND A VARIABLE COMPONENT, WHOSE FREQUENCY IS EQUAL TO THE FREQUENCY OF THE FORCED OSCILLATIONS, AND WHOSE AMPLITUDE IS PROPORTIONAL TO THE AMPLITUDE OF THE FORCED OSCILLATIONS, APPEARS IN THE SENSOR CIRCUIT.

UNCLASSIFIED

3/3 020 UNCLASSIFIED PROCESSING DATE--090CT70

CIRC ACCESSION NO--AP0110456

ABSTRACT/EXTRACT--FIELD EXPERIMENTS ARE DESCRIBED (REGISTERING NEARBY IMPACTS, USE IN THE REFLECTED WAVES, REFRACTED WAVES AND DEEP SEISMIC SOUNDING METHODS, REGISTERING EARTHQUAKES). IT WAS FOUND THAT IN ALL CASES WHEN REGISTERING EXPLOSIONS AT DIFFERENT DISTANCES AND WHEN REGISTERING EARTHQUAKES THE ELECTROCHEMICAL SEISMIC DETECTORS HAD A GREATER RESPONSE THAT THE ELECTRODYNAMIC INSTRUMENTS. THE FREQUENCY CHARACTERISTIC OF THE TESTED ELECTROCHEMICAL DETECTORS IS CLOSE TO THE CHARACTERISTIC OF AN ELECTRODYNAMIC DETECTOR WITH A CHARACTERISTIC FREQUENCY OF 1 CPS. THE SMALL SIZE AND WEIGHT OF THE ELECTROCHEMICAL SEISMIC DETECTOR AFFORD GREAT POSSIBILITIES FOR INCREASING RESPONSE OF THE ENTIRE APPARATUS AND CHANGING OBSERVATIONAL TECHNIQUES. IN PARTICULAR, THERE CAN BE AN INCREASE IN INSTRUMENT RESPONSE BY LOWERING IT INTO DEEP BOREHOLES. IT IS CLEAR THAT ELECTROCHEMICAL DETECTORS IN THE FUTURE WILL BE USED EXTENSIVELY IN SEISMIC OBSERVATIONS, BUT ONLY AFTER MANY PROBLEMS ARE SOLVED. FACILITY: INSTITUTE OF PHYSICS OF THE EARTH. FACILITY: INSTITUTE OF ELECTROCHEMISTRY.

UNCLASSIFIED

USSR

UDC 539.374

KHARCHENKO, T. G., LUKOVICH, V. V.

"Possibility of Simulating Elastic-Plastic Bending of Plates"

Minsk, V sb. 26 Nauchno-tekhn. konferentsiya Belorussk. politekhn. in-ta. Materialy Sektsii stroit. mekhan. (26th Scientific and Technical Conference of the Belorussian Polytechnical Institute. Materials of the Construction Mechanics Section -- Collection of Works), 1970, pp 138-144 (from RZh-Mekhanika, No 10, Oct 70, Abstract No 10 V341)

Translation: The problem of transverse bending of plates of arbitrary outline made of material subjected to the Trask condition is solved on the basis of the relations of deformation theory of plasticity. Expressions are presented for the bending moments and torques for an elastic core and for the part of the material converted to the plastic state. The latter are obtained under the assumption of ideal plasticity and also linear or step workhardening. The yield condition is represented in the form of an equation the left-hand side of which has biharmonic structure

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USSR

KHARCHENKO, T. G., et al, V sb. 26 Nauchno-tekhn. konferentsiya Belorussk. politekhn. in-ta. Materialy Sektsii stroit. mekhan., 1970, pp 138-144

and the right-hand side is nonlinear and depends on the form of the diagram of the material (workhardened or ideal). This representation together with conversion to the finite-difference scheme permitted realization of the iteration procedure on a variable structure integrator supplemented by a unit for calculating the nonlinear right-hand side. The block diagram of the integrator is presented. The bibliography has 5 entries.

2/2

1/2 025 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--MECHANISM OF THE LIGHT STABILIZATION OF POLYSTYRENE PLASTICS -U-

AUTHOR-(04)-MATVEYEVA, E.N., KIRILLOVA, E.I., LEITMAN, K.A., LUKOVNIKOV, A.F.

COUNTRY OF INFO--USSR

SOURCE--PLAST. MASSY 1970, (5), 60-2

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--PHOTOLYSIS, CHEMICAL STABILIZER, HYDROXYL RADICAL, BENZENE DERIVATIVE, ORGANIC AZOLE COMPOUND, POLYSTYRENE RESIN, PHOTOEFFECT, ORGANIC NITRILE COMPOUND, AROMATIC KETONE, TAUTOMERISM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/0922 STEP NO--UR/0191/70/000/005/0060/0062

CIRC ACCESSION NO--AP0134651

UNCLASSIFIED

2/2 025 UNCLASSIFIED PROCESSING DATE--27NOV70
CIRC ACCESSION NO--AP0134651
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IT WAS ESTABLISHED THAT THE LIGHT STABILIZER 2,(2,HYDROXY,5,METHYLPHENYL)BENZOTRIAZOLE (I) DOES NOT UNDERGO CHEM. CHANGES OR REACT WITH POLYSTYRENE (II) DURING IRRADN., AND DOES NOT REACT WITH THE PRODUCTS OF II PHOTODEGRADATION. THE ABOVE OBSERVATIONS ARE ALSO TRUE FOR THE STABILIZERS RR PRIME1 C:CR PRIME2 CN, 2,HYDROXY,4,METHOXYBENZOPHENONE, 2,2 PRIME,DIHYDROXY,4,METHOXYBENZOPHENONE, OR 2,4,DIHYDROXYBENZOPHENONE. THESE BENZOPHENONES UNDERGO KE,TO,ENOL TAUTOMERISM REQUIRING THE ABSORPTION OF LIGHT ENERGY. H-BONDING IS CONSIDERED TO PLAY A ROLE IN THE STABILIZATION MECHANISMS.

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DEPARTMENT OF THE NAVY
NAVAL INTELLIGENCE SUPPORT CENTER
TRANSLATION DIVISION
4301 SUITLAND ROAD
WASHINGTON, D.C. 20390

CLASSIFICATION: UNCLASSIFIED

APPROVED FOR PUBLIC RELEASE, DISTRIBUTION UNLIMITED

TITLE: Measuring the Oscillation Relaxation Time of the 00°1 Level of CO_2 Molecules in the Temperature Interval of 300° - 600°K

Izmereniye vremeni kolebatel'noy relaksatsii urovnya 00°1 molekuly CO_2 v intervale temperatur 300-600°K

AUTHOR(S): Biryukov, A.S., Konyukhov, V.K., Lukovnikov, A.I., Myslin, V.A., Serikov, R.I., and Trekhov, Ye. S.

PAGES: 5

SOURCE: Zhurnal prikladnoy spektroskopii, No. 2, 1972
Pages 249-252

ORIGINAL LANGUAGE: Russian

TRANSLATOR: CRM

NISC TRANSLATION NO. 3447

APPROVED C.T.K.

DATE 20 June 1973

LUKOVNIKOV, A. I.

Stress, Strain, and Deformation

USSR

UDC 629.113

KONOVALOV, Ye. G., and LUKOVNIKOV, Yu. N., (Physical Technical Institute, Academy of Sciences BSSR)

"Design of Frictional Screw Transmissions"

Minsk, Vestsi Akademii Navuk BSSR (News of the Academy of Sciences BSSR), No 3, 1970, pp 94-97

Abstract: Frictional screw transmissions are used for winding precision microcoils and in mechanisms in which a low-power input is used to control a high-power output. Several designs are described in which rings ride on a shaft and are advanced by screw motion. Design parameters depend on 1) the number of rings, 2) the length and diameter of the shaft, 3) inside diameter of the rings, 4) relative angle of rotation between the shaft and the ring during one revolution of the shaft, 5) whether the shaft is axially fixed or advances, 6) whether the rings advance along the shaft or remain in position while the shaft advances, 7) length of throw of the rings or shaft, 8) the distance between shaft bearings, 9) the amount of power required, 10) the frictional forces involved, etc.

Six configurations of rings and shafts and bearings are discussed. Figure a shows a configuration for the simple case of long shaft advance in which sleeve

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USSR

KONOVALOV, Ye. G., and LUKOVNIKOV, Yu. N., Vestsi Akademii Navuk BSSR (News of the Academy of Sciences BSSR), No 3, 1970, pp 94-97

bearings are spaced close together on either side of the single ring. Figure b shows the recommended configuration for the design in which the rings move a short distance along the shaft. A moving carriage with roller bearings to support the shaft is provided for dynamic stability. The carriage paces the advancement of the ring along the shaft. If the rings move a long distance along the shaft, a rolling carriage is again recommended, but the shaft is additionally supported by roller bearings, as shown in figure c. For short throws, the configuration shown in figure d is used. Figure e is for the case of an advancing shaft when multiple rings are used, and figure f is for a long-distance ring advancement along the shaft.

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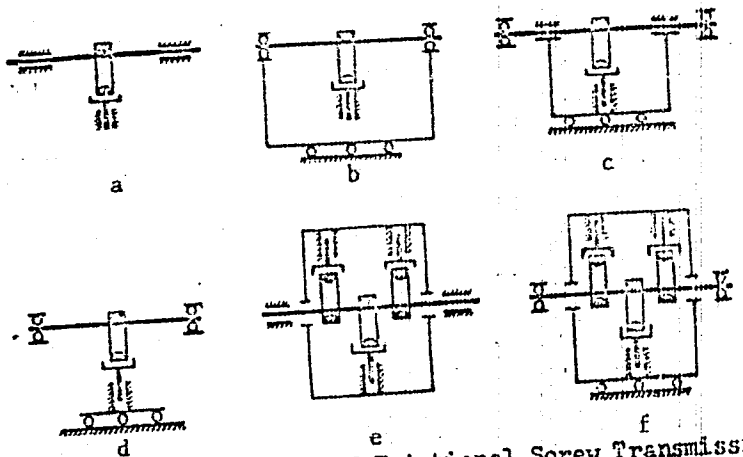
KONOVALOV, Ye. G., and LUKOVNIKOV, Yu. N., Vestsi Akademii Navuk BSSR (News of the Academy of Sciences BSSR), No 3, 1970, pp 94-97



Variations in Design of Frictional Sorew Transmissions

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USSR

KONOVALOV, Ye. G., and LUKOVNIKOV, Yu. N., Vestsi Akademii Navuk BSSR (News of the Academy of Sciences BSSR), No 3, 1970, pp 94-97

Step-by-step procedures are outlined for designing the transmission system for various applications, and initial dimensional values are suggested.

Orig. art. has 2 figs. and 6 refs.

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USSR

UDC 532.59

LUKOVSKIY, I. A.

"Determining the Dynamic Characteristics of a Liquid in a Moving Container in a Weak Gravitational Field by the Method of Expansion into Eigenfunctions"

Kiev, Matematicheskaya Fizika, No 11, 1972, pp 57-64

Abstract: The problem with which the present paper deals is the motion of a solid-liquid system in a weak gravitational field, where the question of the effect of surface tension on the motion of a limited volume of the liquid with a free surface is taken into account. The author proposes a means of solving this problem through an expansion in terms of the eigenfunctions of the boundary value problem with the parameter in the limiting condition. The method is used to solve the problem of body-liquid dynamics for the case in which a cavity close to the free surface of the liquid is cylindrical in form and is also in contact with other surfaces. It is shown how the method can be generalized to extend to a broader class of cavities. In the analysis, the liquid is assumed ideal, and the vessel containing it stipulated to move at

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LUKOVSKIY, I. A., Matematicheskaya Fizika, No 11, 1972, pp 57-64

right angles to the vessel's axis of symmetry. Two cases are considered: the first, of a cylinder with a flat free surface; the second, of a cylinder with curvilinear free surface. The method is found to be sufficiently accurate for practical purposes.

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1/2 011 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--KINETICS OF ELECTRODE REACTIONS IN AN IODINE IODIDE SYSTEM. I -U-

AUTHOR-(03)-BARBASHEVA, I.YE., POVAROV, YU.M., LUKOVTSEV, P.D.

COUNTRY OF INFO--USSR

SOURCE--ELEKTROKHIMIYA 1970, 6(1), 92-7

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ELECTRODE REACTION, IODINE, PLATINUM ELECTRODE, REACTION KINETICS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/0465 STEP NO--UR/0364/70/006/001/0092/0097

CIRC ACCESSION NO--AP0107071

UNCLASSIFIED

2/2 011 UNCLASSIFIED PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0107071

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE KINETICS OF THE ANODIC AND CATHODIC REACTIONS IN THE I SUB2-I PRIME NEGATIVE SYSTEM WAS STUDIED AT 25DEGREES BY MEASURING THE POLARIZATION AT A PT ROTATING DISK ELECTRODE (1 MM DIAM.) MOUNTED IN TEFLON (8 MM DIAM.). THE SOLN. CONTAINED 0.2 N KI PLUS 10 PRIME NEGATIVE2. THE CATHODIC CURVES SHOWED DIFFUSION LIMITATIONS, WHEREAS NO LIMITING DIFFUSION CURRENT WAS OBSERVED ANODICALLY. THE ANODIC REACTION WAS 1ST ORDER IN I PRIME NEGATIVE, AND THE CATHODIC REACTION WAS 1ST ORDER IN I SUB3 PRIME NEGATIVE. THE UNSYM. ANODIC AND CATHODIC PARTIAL CURRENTS WERE PLOTTED FOR CATHODIC POTENTIALS TO 50 MV AND ANODIC POTENTIALS TO 200 MV. NO LINEAR TAFEL REGION WAS OBSERVED. BECAUSE NO FILM WAS FORMED ANODICALLY AND BECAUSE THE ANODIC REACTION PROCEEDED AT A POTENTIAL 83 MV MORE NEG. THAN THE REACTION (1) 2I PRIME NEGATIVE YIELDS I SUB2 PLUS 2E, THE MOST LIKELY OVERALL ANODIC REACTION WAS 3I PRIME NEGATIVE YIELDS I SUB3 PRIME NEGATIVE PLUS 2E, WHICH PROBABLY INVOLVED SOME INTERMEDIATE BECAUSE THE SUM OF THE ANODIC AND CATHODIC TRANSFER COEFF. DID NOT EQUAL 1. AT HIGH I PRIME NEGATIVE CONCN. AND LARGE POLARIZATION, REACTION (1) ALSO OCCURRED; UNDER THESE CONDITIONS THE ANODIC REACTION WAS CONTROLLED BY MIXED KINETICS. FACILITY: INST. ELEKTROKHIM., MOSCOW, USSR.

UNCLASSIFIED

1/2 015 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--KINETICS OF ELECTRODE REACTIONS IN AN IODINE,IODIDE SYSTEM. II -U-

AUTHOR-(03)-POVAROV, YU.M., BARBASHEVA, I.YE., LUKOVTSEV, P.D.

COUNTRY OF INFO--USSR

SOURCE--ELEKTROKHIMIYA 1970, 6(3), 306-11

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CHEMICAL REACTION KINETICS, IODINE, CHEMICAL REACTION RATE, CHEMICAL REACTION MECHANISM, PLATINUM ELECTRODE, CHEMICAL REDUCTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1994/1864 STEP NO--UR/0364/70/006/003/0306/0311

CIRC ACCESSION NO--AP0115683
UNCLASSIFIED

2/2 015 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0115683

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DEPENDENCE OF THE OXIDN. AND REDN. RATES IN THE SYSTEM I SUB2-I PRIME NEGATIVE AT 25DEGREES ON PT ELECTRODES AS A FUNCTION OF THE CONCNS. OF I PRIME NEGATIVE AND I SUB2 WAS DETD. A 5 STEP OXIDN. REDN. MECHANISM IS PROPOSED AND THE RATE CONSTS. WERE COMPUTED. FACILITY: INST. ELEKTROKHIM., MOSCOW, USSR.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--EFFECTS OF THE NATURE OF ELECTRODE METAL AND STATE OF THE ELECTRODE SURFACE ON THE LIMITING DIFFUSION CURRENT IN OXIDATION REDUCTION SYSTEMS
AUTHOR-(03)-POVAROV, YU.M., TRUKHAN, A.M., LUKOVTSEV, P.D.

COUNTRY OF INFO--USSR

SOURCE--ELEKTROKHIMIYA 1970, 6(4), 602-12

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--METAL ELECTRODE, PLATINUM ELECTRODE, GOLD, PALLADIUM, IRIDIUM, REDOX REACTION, IRON

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/0686 STEP NO--UR/0364/70/006/004/0602/0612

CIRC ACCESSION NO--AP0124358
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2/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124358

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AT ROTATING DISK ELECTRODES (EITHER 0.5 OF 1 MM DIAM.) OF PT, PD, IR OR AU, THE LIMITING DIFFUSION CURRENTS (I SUBD) FOR THE 2 REDOX SYSTEMS, FE (CN)SUB6 PRIME3 NEGATIVE-FE(CN)SUB6 PRIME4 NEGATIVE AND I PRIME NEGATIVE-I SUB2 AT 0-50DEGREES WERE MEASURED. THE VALUES OF I SUBA AT ACTIVATED ELECTRODES OF PT, PD AND AU WERE APPROX. IDENTICAL AND SHOWED A LINEAR DEPENDENCE ON THE SQUARE ROOT OF ROTATION RATE (OMEGA PRIMEONE HALF). FOR THE IR ELECTRODE WITH BOTH REDOX SYSTEMS, THE I SUBD-OMEGA PRIMEONE HALF RELATION WAS NONLINEAR; INLINEARITY WERE ASSUMED, THEN THE INTERCEPT WAS NOT AT ZERO. AT THE PASSIVATED PT ELECTRODE IN THE FE REDOX SYSTEM AND AT A POISONED PD ELECTRODE, THE I SUBD-OMEGA PRIMEONE HALF RELATION WAS NONLINEAR. FOR THE ACTIVATED PT, PD, AND AU ELECTRODES, THE LIMITING CURRENT ACTIVATION ENERGY (E SUBA) WAS SIMILAR TO 2.3 KCAL-MOLE FOR THE FE SYSTEM AND INDEPENDENT OF THE ROTATION RATE, BUT AT THE IR ELECTRODE E SUBA VARIED FROM 0.4 TO 1.6 KCAL-MOLE WHEN THE ROTATION VARIED FROM 960 TO 7200 RPM. THESE RESULTS ARE EXPLAINED ON THE BASIS OF HINDERED ELECTRON TRANSFER AT NONUNIFORM ELECTRODE SURFACES, WHICH WERE INACTIVATED BY ADSORPTION OF O OR MOLES OF ORG. OR INORG. SUBSTANCES. THE DIFFUSION COEFFS. FOR THE VARIOUS SPECIES AT 25DEGREES ARE GIVEN.

FACILITY: INST. ELEKTROKHIM., MOSCOW, USSR.

UNCLASSIFIED

1/2 007 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--IODINE ELECTROREDUCTION ON A PLATINUM ELECTRODE -U-

AUTHOR-(03)-BARBASHEVA, I.YE., POVAROV, YU.M., LUKOVTSEV, P.D.

COUNTRY OF INFO--USSR

SOURCE--ELEKTROKHIMIYA 1970, 6(2), 175-81

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ELECTROCHEMICAL REDUCTION, IODINE, PLATINUM ELECTRODE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1998/1146 STEP NO--UR/0364/70/006/002/0175/0181

CIRC ACCESSION NO--AP0121705

UNCLASSIFIED

2/2 007 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121705

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ELECTROREDN. OF I AT THE ROTATING PT ELECTRODE IN A SOLN. OF KL PLUS I SUB2 WAS SUTDIED IN THE PRESENCE OF EXCESS NA SUB2 SO SUB4. THE LIMITING CATHODIC CURRENT I SUBL GRADUALLY DECREASES IN TIME; THIS MAY BE RELATED TO THE DECREASE IN THE NO. OF ACTIVE SITES ON THE ELECTRODE SURFACE. THE LIMITING CURRENT INCREASES LINEARLY WITH THE SQUARE ROOT OF V (V IS ROTATIONAL VELOCITY IN RPM) AT LOW CURRENTS. THE I SUBL FOR AN ACTIVATED ELECTRODE IS PRACTICALLY INDEPENDENT OF THE MICROROUGHNESS OF THE ELECTRODE OVER THE ROUGHNESS FACTOR RANGE FROM 1 TO 300. FACILITY: INST. ELEKTROKHIM., MOSCOW, USSR.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--ANOMALOUS DEPENDENCE OF LIMITING CURRENT ON THE ROTATION RATE OF AN ELECTRODE IN PT FE(CN)SUB6 PRIME4 NEGATIVE-FE(CN)SUB6 PRIME3 NEGATIVE

AUTHOR-(03)-TRUKHAN, A.M., POVAROV, YU.M., LUKOVTSEV, P.D.

COUNTRY OF INFO--USSR

SOURCE--ELEKTROKHIMIYA 1970, 6(3), 425-9

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--PLATINUM ELECTRODE, FERRICYANIDE, LOW TEMPERATURE EFFECT, CATHODE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/0844 STEP NO--UR/0364/70/006/003/0425/0429

CIRC ACCESSION NO--AP0124509
UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124509

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A ROTATING PT ELECTRODE WAS INVESTIGATED. THE CURVES OF THE CATHODIC LIMITING CURRENT (I SUBE VS. OMEGA PRIMEO.5, WHERE OMEGA IS THE ROTATION RATE OF THE ELECTRODE) WERE RECORDED FOR SOLNS. (1) OF 2 TIMES 10 PRIME3 NEGATIVE M K SUB3 FE(CN)SUB6 PLUS 0.2 M K SUB4 FE(CN)SUB6 AND (2) OF 0.2M KI PLUS 5 TIMES 10 PRIME2 NEGATIVE M I SUB2 FOR VARIOUS TEMPS. THE CURVE AT 25DEGREES IS LINEAR AND PASSES THROUGH THE ORIGIN. THE DIFFUSION COEFFS. ARE 7.6 TIMES 10 PRIME6 NEGATIVE AND 9.5 TIMES 10 PRIME6 NEGATIVE CM PRIME2-SEC, RESP. AT LOW TEMPS. (1-5DEGREES), THE CURVE DEVIATES FROM LINEARITY BUT IT DOES PASS THROUGH THE ORIGIN. THE ANODIC CURVES EXHIBIT SIMILAR CHARACTERISTICS. FOR (1) SOLNS., THE ACTIVATION ENERGY, DELTA E OF THE LIMITING CURRENT IS DEPENDENT ON OMEGA. WITH INCREASE OF OMEGA, THE VALUE OF DELTA E VARIES FROM 1.6 TO 2.3 KCAL-MOLE. FOR (2) SOLNS. AT 1-50DEGREES, DELTA E IS 1.95 KCAL-MOL., WHILE FOR A SOLN. CONTG. 0.2M K SUB3 FE(CN)SUB6 PLUS 0.2M K SUB4 FE(CN)SUB6, DELTA E IS INDEPENDENT OF OMEGA (AT 5-50DEGREES) AND IS 2.3-2.4 KCAL-MOL. ANOMALOUS BEHAVIOR OF I SUB3 VS. OMEGA PRIMEO.5 CURVES CAN BE EXPLAINED BY THE HETEROGENEITY OF THE ELECTRODE SURFACE. FACILITY: INST. ELEKTROKHIM., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 621.391.812.61

VOLLERNER, M.F., LUKOYANOV, B.YE.

"Study Of 'Snow-Storm' Radio Interference In The Arctic"

Kiyev, Izv. VUZ:Radioelektronika, Vol XVI, No 2, Feb 1973, pp 89-97

Abstract: The methods and apparatus for conducting experimental studies of "snow-storm" radio interference are described. On the basis of the material of full-scale studies of "snow-storm" radio interference in the arctic an evaluation is made of a one-dimensional function of the distribution of the field intensity of "snow-storm" radio interference and its statistical characteristics. The following conclusions are based on this study: 1) The effect of "snow-storm" radio interference on signal reception begins to appear with a speed of wind with snow $\geq$ 7 m/sec; 2) The predominant factor which determines the integral level of "snow-storm" interference is the speed of wind with snow; the effect of temperature and the relative humidity of the air is insignificant; the integral level of "snow-storm" radio noise linearly depends on the speed of wind with snow; 3) Data are obtained on the conditions of "snow-storm" radio interference in the 0.1 ÷ 10 KHz band with various wind speeds; 4) The probability distribution of the integral field intensity of "snow-storm" radio interference agrees approximately with the probability distribution of the values of the

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VOLLERNER, N.F.,et al, Izv. VUZ:Radioelektronika,Vol XVI,No 2,Feb 1973,pp 89-97

speed of wind with snow; 5) Distribution of the amplitude of the "envelope" of "snow-storm" radio interference $e(t_i)$ is satisfactorily close to the normal; the degree of conformity $p(\lambda) = 0.45 \div 0.89$; (6) The correlation time of "snow-storm" radio interference in the ~ 6 kHz band equals $(1 \div 2.5) \cdot 10^{-3}$ sec. 9 fig. 2 tab. 8 ref. Received by editors, 27 Apr 1971; after revision, 5 July 1971.

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USSR

UDC 621.371.552

VOLLERNER, N.F., LUKOYANOV, B.YE. (Members Of The Scientific-Technical Society of Radio Engineering, Electronics, And Communication imeni A.S. Popov)

"Distribution Of Slow Multiplicative Fluctuations Of Shortwave Signals In High-Latitude Channels Of Radio Communication"

Radiotekhnika, Vol 27, No 3, March 1972, pp 102-105

Abstract: In order to obtain the statistical characteristics of slow fluctuations of shortwave signals, measurements were made of the losses during transmission of signals of known level under natural conditions. The measurements were made in Feb--Aug 1967 with the aid of standard radio equipment on two high-latitude radio channels (longitudinal--length of route $\approx$1000 km; and latitudinal--length of route $\approx$600 km) at three frequencies: 6.48; 7.36; and 8.7 MHz. Evaluations of the distribution functions of the hourly mean of the losses of a signal during propagation are obtained by statistical processing of material from the experimental investigations. The calculated and experimentally obtained signal losses are compared. 1 fig. 2 tab. 4 ref. Received, 17 March 1971; after further improvement, 5 July 1971.

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Acc. Nr: AP0051937 Ref. Code: UR 0219

PRIMARY SOURCE: Byulleten' Eksperimental'noy Biologii i Meditsiny, 1970, Vol 69, Nr 2, pp 112-114

AMINO ACID COMPOSITION OF MYOSIN AND ACTINE IN THE MUSCLES OF EXPERIMENTAL ANIMALS WITH HEREDITARY MYOPATHY

L. O. Badalyan, Ye. S. Bondarenko, Ye. I. Guseo, Yu. Ye. Lukoyanov, G. G. Revich, P. A. Temin, Yu. D. Sharets

N. I. Pirogov II Moscow Medical Institute

Amino acid composition of myosin and actine was analyzed in 10 healthy, 12 sick and 12 heterozygous mice of the 129/RE line with hereditary myopathy. Increased leucin with isoleicin, valine, alanine and lowered tyrosine and histidine content was found in the amino acid spectrum of myosin in sick mice. In heterozygous animals higher valine and lowered tyrosine and histidine levels were recorded. In the amino acid composition of actine in the sick and heterozygous mice glycine was up and histidine — down.

REEL/FRAME
19820420

USSR

UDC 616-009-097

PESHKUS, YU. K., LUKSHIS, L. P., and SADAUSKAS, P. B., Institute of Biochemistry, Academy of Sciences Lithuanian SSR

"Immune Characteristics of Cattle Lympholeukemia. 6. Agglutinin Formation and Blood Serum Protein Fractions After Immunization With Br. Abortus Bovis No 12 Vaccine"

Vil'nyus, Trudy Akademii Nauk Litovskoy SSR, Seriya B, Vol 2 (58), 1972, pp 89-98

Abstract: Cows with chronic lympholeukosis are able to produce antibodies, but the formation of agglutinins is somewhat depressed in them. Thus, after vaccination, the agglutinin titer is sick cows is 1:55 on the 5th day (1:90 in healthy cows), reaches a peak on the 20th day (15th day in healthy cows), and declines faster than in healthy cows. Serum protein concentration in sick cows is somewhat reduced, and the rise after vaccination, from 7.12% initial to 7.27%, is smaller than in healthy cows, from 7.76% initial to 8.20%. In sick cows, albumin level is 3.5% lower than, alpha and beta globulin levels are 2% higher than, and gamma globulin concentration is the same as in healthy cows. In sick cows, vaccination reduces albumin by 3-7%, raises alpha and beta globulins by 1-3%, but induces no significant change in gamma globulin. In 45-60 days, the various protein fractions return to their initial levels. In

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USSR

PESHKUS, YU. K., et al., Trudy Akademii Nauk Litovskoy SSR, Seriya B, Vol 2 (58), 1972, pp 89-98

healthy cows, vaccination reduces albumin by 2-4%, does not change alpha and beta globulins, but increases gamma globulin by 1-3%. These effects are also over in 45-60 days. There is a good correlation between gamma globulin concentration and the agglutinin titer.

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USSR

LUKSHIS, L. P., and SADAUSKAS, P. B., Institute of Biochemistry, Academy of Sciences Lithuanian SSR

"Immunological Characteristics of Cattle Lympholeukosis. 1. Changes in the Phagocytic Properties of Cells of Inflammation Exudate After Immunization With Brucella abortus bovis No 19 Vaccine"

Vilnius, Trudy Akademii Nauk Litovskoy SSR, Seriya B, Biologicheskiye Nauki, Vol 2, 1970, pp 127-134

Abstract: The phagocytic characteristics of cells of the inflammation exudate (neutrophilic leukocytes and macrophages) which migrated into the erosion of living horn tissue were studied in healthy cows and in cows with chronic lympholeukosis before and after immunization with Br. abortus bovis vaccine. Immunization was carried out intramuscularly with 45-50 billion bacterial cells. Inflammation exudate from horn tissue was obtained by the horn window method developed by P. B. Sadauskas and V. B. Dabkyavichyus and involving local application of a Brucella culture to the erosion. In cows with lympholeukosis in the leukemic stage, the phagocytic activity was lowered after immunization 15.7 and 22.9% for neutrophilic leukocytes and

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USSR

LUKSHIS, L.P., and SADAUSKAS, P. B., Trudy Akademii Nauk Litovskoy SSR, Seriya B, Biologicheskiye Nauki, Vol 2, 1970, pp 127-134

macrophages, respectively, together with a simultaneous decrease in the intensity of phagocytosis. In cows with this disease in the subleukemic stage, the reduction in phagocytic activity after immunization was by 10.2 and 3.8% for neutrophilic leukocytes and macrophages, respectively. In healthy cows, immunization produced an increase of phagocytic activity by 32.2 and 31.3% for neutrophilic leukocytes and macrophages, respectively, accompanied by an increase in the intensity of phagocytosis. In both immunized and nonimmunized cows with lympholeukosis, phagocytosis (as indicated by the condition of the Brucella cells that were phagocytized) was defective and incomplete, although the phagocytic activity and intensity of phagocytosis were at a high level in the diseased cows that had not been immunized.

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Acc. Nr: AP0049786 Abstracting Service: CHEMICAL ABST. 5/70 Ref. Code: UR 0467

104713n Thermal conductivity, specific electrical resistance, and specific heat of compact graphites. Luktov, A. I.; Volgin, V. I.; Dymov, B. K. (USSR). *Khim. Tverd. Topl.* 1970, (1), 132–43 (Russ). Thermal cond., K, sp. elec. resistance, ρ, and the heat capacity of graphites of different d. were detd. at 50–2700°K. Graphite of d. 1.0 was isotropic, whereas that of d. 1.9 was anisotropic. The av. dimension, L, of crystallites and the anisotropy of K, were calcd. by the Debye equation, $K_a = (1/4)cv_aL_a$, where v_a is the velocity of phonons along the a axis. K increased with temp., passing through a max. at 175–290°K. The ratio of $K_{max.}$ perpendicular, K'', and parallel, K', to the direction of compression, K'/K'', was 3.2 for graphite of d. 2.0 and 4.5 for graphite of d. 2.1–2.2. The plot ρ vs. temp. passed through a min. at 400–1150°K. The plot log K vs. $1/T$ consisted of intersecting lines. GBJR

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REEL/FRAME
19801704

1/2 026 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--EFFECT OF THE STRUCTURE OF POLY(VINYL CHLORIDE) ON THE RATE OF DIFFUSION OF A PLASTICIZER -U-

AUTHOR-(04)-KOROBKO, V.I., CHALYKH, A.YE., VASENIN, R.M., LUKYANOVICH, V.M.

COUNTRY OF INFO--USSR

SOURCE--PLAST. MASSY 1970, (2), 41-2

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--MOLECULAR STRUCTURE, POLYVINYL CHLORIDE, PHYSICAL DIFFUSION, PLASTICIZER, ACTIVATION ENERGY, THERMAL EFFECT/(U)S5 POLYVINYL CHLORIDE, (U)S60 POLYVINYL CHLORIDE, (U)S75 POLYVINYL CHLORIDE, (U)L7 POLYVINYL CHLORIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/1704 STEP NO--UR/0191/70/000/002/0041/0042

CIRC ACCESSION NO--AP0112698

UNCLASSIFIED

2/2 026 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0112698

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DIFFUSION OF DI-BU PHTHALATE (I) INTO SEVERAL BRANDS OF POLY(VINYL CHLORIDE) (II) (THE MOL. WT. AND D. IN G-CM PRIME3 ARE GIVEN) E.G., S-5 (50,000, 1.403), S-60 (50,000, 1.412), S-75 (68,000, 1.415), AND L-7 (47,000, 1.403) WAS STUDIED BY AN OPTICAL METHOD (R. M. VASENIN, ET AL., 1965). THE EFFECTIVE DIFFUSION COEFF. (D) WAS A LINEAR FUNCTION OF 1-T FOR THE ENTIRE TEMP. RANGE. THE APPARENT ACTIVATION ENERGY OF DIFFUSION (E) FOR THE VARIOUS II BRANDS DECREASED IN THE ORDER E SUBS-5 SMALLER THAN E SUBL-7 SMALLER THAN E SUBS-60 SMALLER THAN E SUBS-75, WHEREAS D OBEYED THE ORDER: D SUBS-5 GREATER THAN D SUBL-7 GREATER THAN D SUBS-60 GREATER THAN D SUBS-75. S-75 GLOBULES WERE ELONGATED AND RESEMBLED A FIBRILLAR SUPRAMOL. STRUCTURE, WHICH MADE ITS PACKING D. CONSIDERABLY HIGHER THAN THAT OF OTHER BRANDS, AND CONSEQUENTLY, S-75 EXERTED GREATER RESISTANCE TO THE PENETRATION OF I.

UNCLASSIFIED

USSR 529.781:621.397.6

PALIY, G.N., LUK'YANCHENKO, YA.I., FEDOROV, YU.A., VNUKOV, YE.M.

"Experimental High-Precision System Of Transmission Of The Dimensions Of Time And Frequency Units On Television Broadcasting Channels"

Izmeritel'naya tekhnika, Moscow, No 1, Jan 1972, pp 34-37

Abstract: An established experimental system is described which assures joining the time scale of television channels in various cities of the European part of the USSR with an error of less than 1 microsecond. A block diagram of the system is shown. The authors express their thanks to S.N. Mordovin, V.F. Zhelezov, V.S. Krasulin, V.G. Il'in, L. A. Abramov, G.A. Zadykin, M.D. Sopel'nikov and other specialists who took an active part in creation of the system. Received by editors 20 Sept 71. " fig. 1 tab. 7 ref.

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Coatings

USSR UDC 669.293.84

ZEMSKOV, G. V., KOGAN, R. L., LUKYANOV, R. M., and LUKYANCHENKO, YE. M., Odessa

"Diffusion Surface Alloying of Niobium with Chromium, Titanium, and Silicon"

Moscow, Izvestiya Akademii Nauk SSSR -- Metally, No 5, 1970, pp 224-226

Abstract: This paper contains an investigation of the process of formation of coatings on VN-2 niobium alloy with diffusion saturation of it by chromium, titanium, and silicon. The diffusion surface alloying was performed in a mixture of powdered saturating elements with addition of a case-hardening element. The alloy was saturated simultaneously with chromium and titanium and then silicon. The process of diffusion surface alloying was studied at various temperatures (1,000-1,200°C) and various saturation periods (1-15 hours). The distribution of the saturating elements and niobium with respect to depth of the diffusion layers was studied by the methods of microstructural analysis, x-ray micrography, and microradiography.

During simultaneous diffusion of chromium, titanium, and silicon into VN-2 alloy, as a result of the mutual effect, variation of the depth of diffusion of the elements and also the nature of their distribution in a layer by

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ZEMSKOV, G. V., et al, Izvestiya Akademii Nauk SSSR -- Metally, No 5, 1970, pp 224-226

comparison with the single-component saturation process is observed. In the case of complex alloying of the surface of niobium alloys in order to obtain multicomponent phases in the coating, it is necessary to select the process parameters so as to insure identical depth of diffusion of the saturating elements. A figure is presented which illustrates the effect of the temperature and duration of the titanium-chromizing and siliconizing processes on the depth of diffusion of the alloying elements into the alloy. From this figure it is clear that increasing the titanium-chromizing process temperature is favorable since it effectively increases the depth of penetration of chromium into the diffusion layer.

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Semiconductors and Transistors

USSR UDC: 621.382.2

LUK'YANCHIKOVA, N. B., SOLGANIK, B. D., SHEYNMAN, M. K., PROTASOV, I. I., and TROFIM, V. G.

"Excess Noise in Heterogeneous p-$Al_xGa_{1-x}As$--n-GaAs Photodiodes"

Leningrad, Fizika i tekhnika poluprovodnikov, No 10, 1972, pp 1851-1855

Abstract: Stating that research on the noise characteristics of heterojunctions has been neglected, the authors present the results of experimental investigations into the low-frequency noise characteristics, at 20-$2 \cdot 10^3$ Hz, of p-$Al_xGa_{1-x}As$--n-GaAs specimens. The specimens were obtained by the growth of solid solution AlAs-GaAs p-type epitaxial layers on n-GaAs substrates. The current noise spectral density was measured in darkness with the heterojunctions biased in the forward as well as inverse directions, and with the heterojunctions illuminated in the gate and photodiode modes. The measurements were conducted at temperatures of 77-300° K and the wavelength of the illuminating light was 0.68 microns. It was found that the current noise was in all cases much higher than the shot noise level, and that illumination of the specimens did not vary the current noise spectral density with the specimens biased

USSR UDC: 621.382.2

LUK'YANCHIKOVA, N. B., et al, Fizika i tekhnika poluprovodnikov, No 10, 1972, pp 1851-1855

in the inverse direction. Current noise spectral densities and families of volt-ampere characteristics of the specimens are plotted.

USSR

UDC 621.382.2

LUK'YANCHIKOVA, N. B., GARBAR, N. P., SHEYNKMAN, M. K., Institute of Semiconductors of the Ukrainian SSR Academy of Sciences, Kiev

"Excess Currents and Noise of Forward-Biased GaP Diodes"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 6, No 5, 1972, pp 869-877

Abstract: Joint studies were made of the excess currents and excess noise in GaP light diodes with forward-bias in the dark and with illumination. The excess currents observed in the initial sections of the volt-ampere characteristics of the GaP diodes which are frequently characterized by a complex i(u) function, are related to the tunnel-recombination surmounting of the p-n-junction potential barrier by the carriers. The tunnel-recombination currents do not run through the entire area of the p-n-junction but only through the basic regions the thicknesses of which are much less than its mean thickness and the total area is 1-2 orders less than the total area of the junction. The current noise observed in the excess current region is also excess, it has a spectrum of the 1/f type and is generated in the space charge region of the p-n-junction while the excess forward current passes through it. In a region of higher U when the primary contribution to the total diode current is made by the thermal emission current, the observed excess noise 1/f is still caused

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USSR UDC 621.382.2

LUK'YANCHIKOVA, N. B., et al., Vizika i Tekhnika Poluprovodnikov, Vol 6, No 5, 1972, pp 869-877

by the presence of tunneling of a small part of the carriers through the p-n-junction. The presence of a plateau in the $S_i(i)$-functions can arise from the fact that the investigated noise is generated only in the "special" regions of the p-n-junction or by the existence of a defined relation between the tunnel recombination and the TE current mechanisms in the investigated diodes. The effect of light on the junction reduces to a reduction in height of the potential barrier. The excess current mechanism and the mechanism of the excess noise accompanying this current do not change under the effect of light.

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UDC 621.382.2

TYAGAY, V. A., KOLBASOV, G. YA., LUK'YANCHIKOVA, N. B., SOLGANIK, B. D.

"Study of Photosensitivity and Noise of Semiconductor-Electrolyte Barrier Contacts"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 6, No 2, 1972, pp 248-253

Abstract: A detailed study was made of the volt-ampere characteristics, complex conductivity and noise of a CdSe-electrolyte barrier contact during irradiation of it in the band-band absorption region. The lifetime of the minority current carriers was determined, and the threshold sensitivity of the contact was found. The photothreshold is limited by the noise of the charge capture process in the traps in the CdSe barrier layer region. The noise of the limiting photocurrent of the contact is caused by power fluctuations of the incident photon flux. The threshold sensitivity of a number of semiconductor-electrode contacts with different width of the forbidden band was determined. From the tabulated data it follows that the semiconductor cadmium chalcogenides with a sufficiently broad forbidden band have the best photosensitivity. Decreasing the width of the forbidden band (or high admixture concentration, as in the case of GaP) leads to an increase in the dark currents, and the sensitivity becomes appreciably worse. The photothreshold for Ge and CdTe crystals of the

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TYAGAY, V. A., et al., Fizika i Tekhnika Poluprovodnikov, Vol 6, No 2, 1972, pp 248-253

p-type is appreciably below that for the corresponding samples of the n-type. This behavior is partially caused by a decrease in the phenomenological quantum yield and can be connected with the high rate of surface pair recombination on the surface of the semiconductors in the negative bias region.

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USSR UDC 621.317.3:621.3.084 (088.8)

YEGOROV, G.P., KALININ, A.N., LUK'YANENKO, A.I., MESTECHKIN, YA. I., SHUBIN, L.V.

"Device For Investigation Of Electron Streams"

USSR Author's Certificate No 263753, filed 22 Apr 66, published 24 June 70 (from RZh--Elektronika i yeye primeneniye, No 2, February 1971, Abstract No 2A127P)

Translation: The device proposed for investigation of an electron stream contains a vacuum chamber with an electron gun, and differs from known devices of this type by the fact that the vacuum chamber is combined with additional vacuum chambers. This assures identical vacuum conditions in the process of measurement of one and the same electron stream by various measuring elements. The electron gun can turn around the axis of the vacuum chambers for successive settings as compared to the respective additional vacuum chambers, and it can also move along the axis of the additional vacuum chambers with the aid of a special device. 2 ill. G.B.

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1/2 024 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--STATE OF THE RESPIRATORY FUNCTION, CARDIO VASCULAR SYSTEM AND WORKING CAPACITY IN PATIENTS WITH SIDEROSILICOSIS FOLLOWING PULMONARY

AUTHOR--LUKYANENKO, M.S.

COUNTRY OF INFO--USSR

SOURCE--VRACHEBNOYE DELO, 1970, NR 5, PP 87-89

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--RESPIRATION, CARDIOVASCULAR SYSTEM, LUNG, SURGERY, TUBERCULOSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1717 STEP NO--UR/0475/70/000/005/0087/0089

CIRC ACCESSION NO--AP0129085

UNCLASSIFIED

2/2 024 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0129085

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SPARING PULMONARY RESECTIONS WERE PERFORMED FOR DIFFERENT FORMS OF TUBERCULOSIS IN 45 PATIENTS WITH INITIAL PHENOMENA, IN 44 WITH THE FIRST AND IN SIX WITH THE SECOND STAGE OF SIDEROSILICOSIS. FAVOURABLE RESULTS OF SURGICAL INTERVENTION WERE OBSERVED IN 91 PATIENTS. IT WAS FOUND THAT SURGERY BEING EFFICIENT, THE INDICES OF EXTERNAL RESPIRATION FUNCTION REACHED THE PREOPERATIVE LEVELS IN ONE YEAR FOLLOWING SURGERY AND THE WORKING CAPACITY PROGNOSIS IS SIGNIFICANTLY IMPROVED.

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APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002201820020-4"

Pharmacology and Toxicology

USSR UDC 541.69+547.572+547.636.4

KHAZHAKYAN, L. V., LUK'YANENKO, N. L., ALIYEV, R. K., and GEVORKYAN, G. A., Institute of Fine Organic Chemistry imeni A. L. Mndzhoyan, Academy of Sciences Armenian SSR, Yerevan

"The Constants of Association of Some Aminoketones with Phenol and the Physiological Activity of These Compounds"

Yerevan, Armyanskiy Khimicheskiy Zhurnal, Vol 25, No 6, 1972, pp 476-481

Abstract: By using IR spectroscopy, the constants K of association of the physiologically active aminoketones p-ROC_6H_4-C(O)-CH(Ph)-$CH_2N(CH_2)_5$ (I), p-ROC_6H_4-C(O)-CH(Ph)-$CHN(CH_2)_4$ (II), and Ph-C(O)-CH(C_6H_4OR-p)-$CHN(CH_2)_4$ (III) with phenol were determined. For compounds I-III, both the value of K and the analegesic activity increased with an increasing size of R from Me to Bu and then decreased at R = Am . In compounds IV derived from Ph-C(O)-CCH_2--CH_2R, where R is $N(CH_2)_4$ or $N(CH_2)_5$, that contained two alkoxy groups in the 2 and 6 or 2 and 4 positions of the phenyl ring, increasing of the size of the alkoxy groups in the o-position to the ester group reduced the value of

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KHAZHAKYAN, L. V., et al., Armyanskiy Khimicheskiy Zhurnal, Vol 25, No 6, 1972, pp 476-481

K. Even if an alkoxy radical was present in the p-position of the phenyl in IV, the value of K decreased instead of increasing as in the case of I-III. This was due to steric hindrance. The values of K were higher for compounds I-II, in which the electron density was displaced from the alkoxy group to the CO group over a conjugated system, than for compounds III, in which displacement occurred because of an inductive effect. Beginning with the Am group, steric hinderance in I-III interfered with the formation of phenol association products. As a result of the decreased tendency to form association products, both K and the physiological activity decreased. The preparation of the compounds used in the study and their properties are described by Gevorkyan et al in Arm. Khim. Zh., 24, 32, 1971; 24, 333, 1971. Determinations of the physiological activity were carried out at the Laboratory of Analgesics and Hypnotics under the direction of S. N. Auratyan.

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1/2 030 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--SOLUTION OF A PLANE PROBLEM ON RADIANT HEAT EXCHANGE BETWEEN A PAIR OF INDEFINITE GRAY BANDS IN THE PRESENCE FLAT SIDE SURFACES -U-
AUTHOR--LUKYANENKO, O.P.

COUNTRY OF INFO--USSR

SOURCE--NAUCHN. TR. KRASNODARSK. POLITEKHN IN-T (SCIENTIFIC WORKS OF THE
REFERENCE--RZH-METALLURGIYA, NR 3, MAR 70, ABSTRACT NR 38150-110
DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--RADIATIVE HEAT TRANSFER, EMISSIVITY CONSTANT, SPECTRAL ABSORPTIVITY, APPROXIMATE SOLUTION, INTEGRAL EQUATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/0789 STEP NO--UR/0000/70/000/004/0100/0110

CIRC ACCESSION NO--AR0117981
UNCLASSIFIED

2/2 030 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AR0117981

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PRINCIPAL STATEMENT OF THE PROBLEM ON RADIANT HEAT EXCHANGE IN A RECTANGULAR CROSS SECTION OF A CHAMBER, SUBDIVIDED INTO THREE ZONES: BASE F SUB1 AND F SUB3 AND LATERAL SURFACE, IS CONSIDERED. THE GIVEN STATEMENT OF THE PROBLEM CAN BE CHARACTERIZED BY THE FACT THAT FOR ALL THREE GRAY OPTICAL HOMOGENEOUS AND ISOTHERMAL BODIES (ZONES) SEPARATED BY A DIATHERMAL MEDIUM, TEMPERATURES T SUB1, T SUB2 AND T SUB3 ARE GIVEN, AND ALSO GEOMETRICAL AND OPTICAL A SUB1, A SUB2 AND A SUB3 PARAMETERS. DETERMINATION OF THE FIELD OF VALUES OF LOCAL DENSITY OF THE RESULTING EMISSION OF ALL THREE BODIES (ZONES) IS REQUIRED. INVESTIGATION AND SOLUTION OF THE PROBLEM ON RADIANT HEAT EXCHANGE IN THE SPECIFIED RADIANT SYSTEM ARE CONDUCTED BY THE METHOD OF APPROXIMATE SOLUTION OF THE INTEGRAL EQUATIONS OF EMISSION. PRESENTATION, IN THE FORM OF GRAPHS, IS MADE OF THE RESULTS OF NUMBERICAL CALCULATIONS OF LOCAL CHARACTERISTICS OF EMISSION OF A RECTANGULAR HOLLOW FOR THE FOLLOWING THREE CASES: WALLS OF THE HOLLOW HAVE IDENTICAL TEMPERATURES AND ABSORPTIVITIES T SUB2 EQUALS T SUB3; A SUB2 EQUALS A SUB3 EQUALS 0.5; 0.75; 0.9; WALLS OF THE HOLLOW HAVE IDENTICAL TEMPERATURES T SUB2 EQUALS T SUB3, BUT DIFFERENT ABSORPTIVITIES A SUB2 EQUALS 0.86; A SUB3 EQUALS 0.9; WALLS OF THE HOLLOW HAVE DIFFERENT TEMPERATURES T SUB2 NOT EQUAL TO T SUB3 AND DIFFERENT ABSORPTIVITIES A SUB2 EQUALS 0.85, A SUB3 EQUALS 0.8.

UNCLASSIFIED

USSR UDC 621.791.754:546.821

GUREVICH, S. M., BLASHCHUK, V. Ye., Ye. O. Paton Electric Welding Institute, LUK'YANENKO, V. M., SHELENKOV, G. M., Suma Machine Building Plant

"Welding of Chemical Apparatus of AT3 Titanium Alloy"

Kiev, Avtomaticheskaya Svarka, No 11, Nov 72, pp 45-48

Abstract: This work studies the weldability and develops a production technology for welding of chemical apparatus of AT3 titanium alloy. The alloy studied had the following chemical composition: 2.5% Al, 0.41% Fe, 0.17% Si, 0.3% Cr, 0.1% O, 0.004% H, 0.016% N. The butt joints were produced by argon-arc welding with a tungsten electrode by manual welding with X-shaped placement of edges and automatic welding with an infusible electrode. The welding technology developed was used in the production of hydrolytic apparatus with capacities of 6-50 m^3, wall thickness 10-24 mm. The use of AT3 alloy allows interior volume to be increased by 15-35% over lined steel apparatus, increasing interior volume utilization factor from 74% to 95%.

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USSR UDC 801.51

LUK'YANENKOV, K. F.

"Use of Poisson and Gauss Systems in Studying Distribution of Linguistic Units of Texts. (Based on Materials of Scientific and Technical Texts in the English sublanguage of Marine Mechanisms.)"

Voprosy Lingvostatistiki i Avtomatizatsii Lingvisticheskikh Rabot. Vyp. 3 [Problems of Linguistic Statistics and Automation of Linguistic Work, No. 3]. Moscow, 1970, pp 5-14 (Translated from Referativnyy Zhurnal Kibernetika, No. 4, April, 1971, Abstract No. 4 V730).

No Abstract.

1/1

1/2 030 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--PHTHALOCYANINES AND RELATED COMPOUNDS. IV. POLYCHLOROPHTHALOCYANINES -U-

AUTHOR-(03)-MIKHALENKO, S.A., KOROBKOVA, YE.V., LUKYANETS, YE.A.

COUNTRY OF INFO--USSR

SOURCE--ZH. OBSHCH. KHIM. 1970, 40(2), 400-3

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--PHTHALOCYANINE, UREA, CHLORINATED ORGANIC COMPOUND, COMPLEX COMPOUND, SOLUBILITY, IR SPECTRUM, MOLYBDENUM COMPOUND, CATALYST, VANADIUM OXIDE, ALUMINUM COMPOUND, COPPER COMPLEX

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1119 STEP NO--UR/0079/70/040/002/0400/0403

CIRC ACCESSION NO--AP0128546

UNCLASSIFIED

2/2 030 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0123546

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. HEATING 0.01 MOLE APPROPRIATELY CHLORINATED PHTHALIC ANHYDRIDE WITH 0.1 MOLE UREA AND 0.0035 MOLE METAL CHLORIDE IN C SUB6 H SUB3 CL SUB3 FOR 4 HR AT 200DEGREES IN THE PRESENCE OF NH SUB4 MOLYBDATE OR METAVANADATE CATALYST GAVE THE TITLE PHTHALOCYANINE (PC) COMPLEXES (I). ALTERNATIVELY, EQUIMOLAR AMTS. OF UREA AND O,(NC) SUB2 C SUB6 CL SUB4 HEATED AS ABOVE WITH METAL CHLORIDE IN PHNO SUB2 FOR 4-5 HR ALSO GAVE I, PURIFIED BY TREATMENT WITH AQ. HNO SUB3 AND NAOH. THE CL ATOMS IN I RESULTED IN BATHOCHROMIC SHIFTSIN THE VISIBLE AND NEAR IR REGIONS. SPECTRA WERE REPORTED FOR THE TETRA, 4,CHLORO, TETRA,3,CHLORO, OCTA,3,4,CHLORO, OCTA,4,5,CHLORO, OCTA,3,6,CHLORO, AND HEXADECACHLORO DERIVS. OF VOPC; HEXADECACHLORO ALOPC; THE TETRA,4,CHLORO, TETRA,3,CHLORO, OCTA,3,4,CHLORO, OCTA,4,5,CHLORO, OCTA,3,6,CHLORO, AND HEXADECACHLORO DERIVS. OF CUPC. THE UNSYM. COMPLEXES WERE MORE READILY SOL. IN ORG. SOLVENTS THAN THE SYM. ANALOGS. FACILITY: NAUCH.-ISSLED. INST. ORG. POLUPROD. KRASITELEI, MOSCOW, USSR.

UNCLASSIFIED

AA0008503 LUK YANETS UR=0482.

Soviet Inventions Illustrated, Section I Chemical, Derwent, 7,

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227465 TETRAPHENYL DERIVATIVES OF PHTHALOCYANINE VANADYL are novel compounds which can be used in the optical industry. They are produced by reacting phenylphthalic acid or its anhydride, phenylphthalimide or O-chlorophenyl phthalimide with urea and VCl_3 at 240-280°C. The resulting melt is cooled, comminuted, boiled in water and then in diluted HCl. The product is then separated by known methods. The heating is carried out in a solvent, e.g., bromonapthalene, and the product is treated with alcohol. The process is carried out in the presence of a catalytic amount of ammo

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nium vanadate, The product is dissolved in chlorobenzene and purified by chromatography on alumina. In an example, a mixture of 1.8 g. of phenylphthalic anhydride, 1.9 g of urea and 0.32 g. of VCl_3 was boiled for 5 hrs. in bromonaphthalene. After cooling, the reaction mixt. was diluted with methanol, filtered and washed with methanol. The product was dissolved in chlorobenzene and purified by chromatography on Al_2O_3, using chlorobenzene as an eluent. The yield of tetra -4-phenylphthalocyamine vanodyl was 1g. ($C_{56}H_{32}N_8OV$). 29.5.67, as 1159607/23-4, MIKHALENKO, S.A. and LUK'YANETS, E.A. (12.2.69) Bul. 30/25.9.68. Class 22e/12a, Int. Cl. C 09b/C07c.

JLL

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19550613

1/2 013 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--POTENTIOMETRIC DETERMINATION OF NIOBIUM AS ITS PEROXIDE COMPLEX BY TITRATION WITH SODIUM SULFITE -U-

AUTHOR--LUKYANETS, I.G.

COUNTRY OF INFO--USSR

SOURCE--ZH. ANAL. KHIM. 1970, 25(1) 108-11

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--METAL COMPLEX COMPOUND, NIOBIUM COMPLEX, POTENTIOMETRIC TITRATION, SODIUM COMPOUND, SULFITE, PEROXIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1983/0945 STEP NO--UR/0075/70/025/001/0108/0111

CIRC ACCESSION NO--AP0053869

UNCLASSIFIED

2/2 013 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0053869

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE 1:1 NB-H SUB2 O SUB2 COMPLEX REACTS VERY SLOWLY WITH NA SUB2 SO SUB3 AT 20DEGREES IN A 0.5-3M HCL; THE REACTION RATE INCREASES AT IS GREATER THAN OR EQUAL TO 40DEGREES. A POTENTIOMETRIC METHOD WAS DEVELOPED FOR NB DETN. IN A 0.1M NB SOLN. BY ALKALI FUSION OF NB SUB2 O SUB5, DISSOLN. OF THE MELT IN H SUB2 O, AND ADDN. OF HCL AND H SUB2 O SUB2. EXCESS H SUB2 O SUB2 IS TITRATED POTENTIOMETRICALLY WITH A 0.2N NA SUB2 SO SUB3 SOLN. IN 1M HCL BY USING PT AND CALOMEL ELECTRODES. THEN H SUB2 C SUB2 O SUB4 IS ADDED AND THE LIBERATED H SUB2 O SUB2 IS TITRATED AGAIN WITH NA SUB2 SO SUB3. THE STARTING POTENTIAL IS 365 MV AND THE TITRN. ENDS AT A POTENTIAL OF 460 MV.- NB CONTENT IS CALCD. FROM THE RATIO NB:H SUB2 O SUB2 (BOUND) EQUALS 1:1. THE ERROR IS LESS THAN OR EQUAL TO 1.1PERCENT.

UNCLASSIFIED

USSR UDC 536.423.4:531.66

SARKISOV, A. A., POPOV, I. A., LUK'YANOV, A. A.

"The Mechanism of Condensation of Steam Bubbles in a Steam-Water Mixture Under the Influence of Shock Loads"

Inzhenerno-fizicheskiy Zhurnal, Vol 22, No 3, 1972, pp 429-454.

Abstract: Experimental data are presented on the collapse of steam bubbles in boiling water under the influence of shock loading. The studies were performed with static pressures in the experimental installation of 1, 10, 20 and 30 bar and under the influence of vertical impact loadings with relative accelerations of 35, 50, 75 and 100 g.

The steam-water mixture was observed at the moment of and following impact through quartz glass by high-speed motion picture photography. Analysis of the experimental data showed that the impact action increased the pressure in the boiling liquid. The steam bubbles, entering the field of variable pressure, change their configuration, and the process of bubble destruction is an oscillating process. The time of condensation of the bubble depends on the acceleration applied to the steam-water mixture, the static pressure and bubble size.

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USSR UDC 536.423.4:531.66

SARKISOV, A. A., POPOV, I. A., LUK'YANOV, A. A., Inzhenerno-fizicheskiy Zhurnal, Vol 22, No 3, 1972, pp 429-434.

Condensation of steam bubbles results from two effects: heat exchange and fluid inertia. An increase in static pressure decreases the significance of heat exchange between the steam bubble and the water during condensation and strengthens the effect of the inertia of the liquid, resulting from the change in pressure.

The results of experiments are presented in the form of dependences $R/R_0 = f(\tau_n)$, where $\tau_n = 4/\pi\ Ia^2\ at/R_0^2$ is the dimensionless time, R and R_0 are the instantaneous and initial radii of a steam bubble; a is the heat conductivity factor; t is time.

The experimental curves are generally similar to the theoretical curves, but the rate of condensation of steam bubbles is somewhat higher.

The rate of destruction of bubbles in the experiment performed is explained primarily by the significant speeds of transfer (floating) of bubbles resulting from impact of the experimental sector with a barrier. 3 Figures; 5 Biblio. Refs.

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1/2 013 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--EFFECT OF THE TEMPERATURE USED IN PREPARING STARCH PHOSPHATE STABILIZED EMULSIONS ON THEIR PHYSICOCHEMICAL PROPERTIES -U-

AUTHOR-(03)-SAVOSTIKOVA, N.F., RYBAKOVA, YU.S., LUKVANOV, A.B.

COUNTRY OF INFO--USSR

SOURCE--MASLO ZHIR. PROM. 1970, 36(3), 33-4

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--STARCH, PHOSPHATE, EMULSION, CHEMICAL STABILITY, THERMAL STABILITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/0699 STEP NO--UR/9085/70/036/003/0033/0034

CIRC ACCESSION NO--AP0119606

UNCLASSIFIED

2/2 013 UNCLASSIFIED PROCESSING DATE--23OCT70
CIRC ACCESSION NO--AP0119606
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE GREATEST DISPERSITY OF THE
TITLE: EMULSIONS WAS REACHED AT 400EGREES. FACILITY: MOSK.
TEKHNOL. INST. PISHCH. PROM., MOSCOW, USSR.

UNCLASSIFIED

LUKYANOV, A.E. — PHYSICS

INTR. CONF. ON MAGNETICS, DENVER 15-16 APR. 71 — MAGNETICS

ELECTRON MIRROR MEASUREMENTS OF MAGNETIC FIELDS OVER THE AUDIO AND VIDEO HEADS AND TAPES.

G.V.SPIVAK, A.E.LUKYANOV, E.I.RAU, [illegible]
Electron Optics Laboratory, Physics Department, Moscow State University, Moscow V-234, USSR

The theoretical treatment of the electron mirror image contrast formation[1,2] made it possible to calculate the magnetic field distribution over the surface of the specimen under investigation. At present use could be made of the electron mirror microscope not only to visualize, but to measure the magnetic fields. The stroboscopic technique[3] enables the measurements to be extended to alternating magnetic fields.

The technique was developed for measurement both the dc and ac magnetic fields over the audio and video recording head gaps and fields over magnetic tapes. The magnetic field distribution could be obtained after processing the experimental data (the current density distribution on a final screen of the electron mirror microscope) on a digital computer or sometimes without it. The technique provides the contactless measurement at any height over the specimen's surface. The accuracy within the range of 10÷20% is available.

While the stroboscopic mode of operation being used, it is possible[4] to measure the frequency response and phase response curves: the variation of the maximum magnetic field and the phase shift between the field and the exciting current, the latter having constant amplitude and phase at any frequency. As an example of the results obtained Fig.1 shows the frequency response curves derived with the aid of an electron mirror microscope within a wide frequency range. Fig.2 gives the electron mirror micrographs of the sine video signals recorded on a magnetic tape and the calculated normal component of the magnetic field as a function of height over the tape's surface. The experimental data are in good agreement with the theoretical exponential curve.

References

1. A.E.Lukianov et al.: Proc.4th Eur.Reg.Conf.El.Microsc., Rome, 1, 105 (1968)
2. M.K.Sedov et al.: Bull.Acad.Sci.USSR, Phys.Ser., 32, 1005 (1968)
3. A.E.Lukianov, G.V.Spivak: Proc.6th Int.Cong.El.Microsc., Kyoto, 1, 611 (1966)
4. E.I.Rau et al.: Bull.Acad.Sci.USSR, Phys.Ser., 34, 1539 (1970)

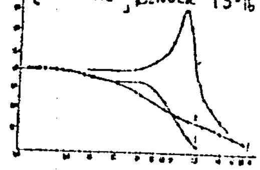

Fig.1. Frequency response curves: 1-ferrite head; 2-video recording head; 3-audio recording head with wide gap. H_0 is the magnetic field of d.c., which value is equal to amplitude of a.c.; f is done in kHz.

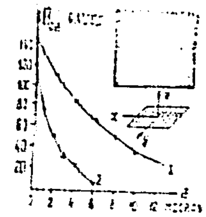

Fig.2. Electron mirror micrographs of the sine video signals (top right). The curves 1,2 are the amplitudes of the normal component H_z as the function of height over the surface of magnetic tape. Video frequency is 1 or 3 MHz, wavelength is 42 (top micrograph) or 14 micron for curve 1 or 2 respectively.

Authors Did Not Appear.
Paper was presented by Stein [illegible] of Calif. [illegible]
Excellent paper with respect to [illegible] electron mirror method for observation of recording head fields

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LUKYANOV, A.E.

USSR

ARAKSLOV, A. G., KOLESNIKOV, B. P., KONONENKO, V. A., LUK'YANOV, A. N., MALOV, V. V., POLYAK, L. Z., ROZANOV, A. N., and TITOV, B. V.

"Device for Studying Structural Changes in Refractory Metals and Alloys"

USSR Authors' Certificate No 356536, Cl. G 01n 23/20, filed 7 Dec 70, published 23 Oct 72 (from Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 32, 1972, p 121)

Abstract: The device, which studies structural changes during high-temperature strain in a vacuum or other environment, contains a working chamber with a beryllium window located on the front cover, a loading mechanism, clamps for the specimen, heaters, mechanisms for measurements and the recording of readings. For purposes of studying the structure of a specimen during tests, the front cover of the working chamber has mounted on it a device for X-ray analysis with a mechanism for the vertical displacement of this device along the specimen and a mechanism for rotating it around a horizontal axis.

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USSR

UDC 536.24

LUK'YANOV, A. T., ROZENFEL'D, G. O., YUMASHEVA, M. G.

"Heat Transfer of Concrete Blocks Under Forced Convection"

V sb. Prikl. i teor. fizika. Vyp. 3 (Applied and Theoretical Physics. No. 3 -- Collection of Works), Alma-Ata, 1972, pp 218-221 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3B913)

Translation: Computational formulas for determining the coefficient of heat transfer of bodies under various conditions of utilization are obtained on the basis of similarity theory. Tables of the relationship between the coefficient of heat transfer and the temperature and velocity of the air flow are given to facilitate practical calculations. 5 ref. Authors' abstract.

USSR

UDC 536.46:533.6

ARTYUKH, L. Yu., ZHUMANOVA, T. Zh., LUK'YANOV, A. T.

"Solution of the Problem of Nonstationary Heterogeneous Combustion Considering Heat and Mass Exchange"

V sb. Prikl. i teor. fizika. (Applied and Theoretical Physics -- Collection of Works), No. 3, Alma-Ata, 1972, pp 195-200 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3B957)

Translation: The problem of nonstationary heterogeneous combustion of a condensed fuel considering heat and mass exchange on the surface is solved by a finite-difference method. The combustion rate is a function of the temperature determined by the Arrhenius law and has a first order in terms of the oxidizer. The heating is produced by an external heater. The solution is illustrated by graphs of the temperature and concentration of oxidizer at the surface as functions of for different parameters of the problem. An approximate analytical solution is given.

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USSR

BORODIKHIN, R. G., LUK'YANOV, A. T., MOLYUKOV, I. D.

"A Method for the Numerical Solution of Hyperbolic Equations"

Alma-Ata, Vestnik Akademii Nauk Kazakhskoy SSR, No 3, Mar 1970, pp 61-63

Abstract: The following problem is considered in the region $0 \leq x \leq a$, $0 \leq y \leq b$:

$$U_{xy} = A(U, x, y)U_x + B(U, x, y)U_y + C(U, x, y), \quad (1)$$

$$U|_{y=0} = \varphi(x); \quad U|_{x=0} = \psi(y), \quad (2)$$

where $\varphi(0) = \psi(0)$. The solution of problem (1), (2) satisfied the integro-differential equation

$$U(x, y) = \varphi(x) + \psi(y) - \varphi(0) + \int_0^x \int_0^y (AU_\xi + BU_\eta + C)\, d\xi\, d\eta. \quad (3)$$

Since the analytical solution of equation (3) involves many mathematical difficulties, the following is a method for the numerical

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BORODIKHIN, R. G., et al, Vestnik Akademii Nauk Kazakhskoy SSR, No 3, Mar 1970, pp 61-63

solution of equation (3) which can be easily carried out on computers of the "static electrointegrator" type. The continuous region D is replaced by a discrete region D' with nodes $x_{i+1} = x_i + \Delta x$ and $y_{j+1} = y_j + \Delta y$, where $\Delta x = \Delta y = h$. The values of the function at the intersection are denoted by: $U(x_i, y_j) = U_i^j$, $U(x_{i+1}, y_j) = U_{i+1}^j$, and $U(x_{i+1}, y_{j+1}) = U_{i+1}^{j+1}$. Equation (3) in the region D' is written in the form

$$U_{i+1}^{j+1} = U_{i+1}^j + U_i^{j+1} - U_i^j + \iint_{\omega} [AU_\xi + BU_\eta + C]\, d\xi\, d\eta, \qquad (4)$$

where $\omega = \begin{cases} x_i \leq x \leq x_{i+1} \\ y_j \leq y \leq y_{j+1} \end{cases}$.

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BORODIKHIN, R. G., et al, Vestnik Akademii Nauk Kazakhskoy SSR, No 3, Mar 1970, pp 61-63

To determine the function U_{i+1}^{j+1} from equation (4) it is sufficient to know its values at neighboring intersections of the grid and to calculate the integral over the region ω by some approximation method. The calculations should begin from the line of initial values, shifting successively from one grid point to another over the entire region D'. The distinguishing feature of this method is that an integral that is a much smoother function than the integrand is approximated; it is possible to limit oneself to a small number of grid points and still obtain a sufficiently good approximation. An example is given.

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1/2 020 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--KINETICS AND MECHANISM OF HOMOGENEOUS CATALYTIC ACTIVATION OF CARBON MONOXIDE IN SOLUTIONS. VII. KINETICS OF CR SUB2 O PRIME2 SUB7
AUTHOR-(04)-FASMAN, A.B., IKHSANOV, ZH.A., PUSTYLNIKOV, L.M., LUKYANOV, A.T.
COUNTRY OF INFO--USSR

SOURCE--ZH. FIZ. KHIM. 1970, 44(2), 401-5

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--REACTION KINETICS, CHEMICAL REDUCTION, CARBON MONOXIDE, CHROMIUM, PLATINUM ELECTRODE, CATALYST ACTIVITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/1222 STEP NO--UR/0076/70/044/002/0401/0405

CIRC ACCESSION NO--AP0128640

UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AP0128640
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. HOMOGENEOUS CATALYTIC REDN. OF CR SUB2 O SUB7 PRIME2 WITH CO IN MINERAL AND ORG. ACIDS FOLLOWS THE OVERALL PATTERN CR SUB2 O SUB7 PRIME2 NEGATIVE PLUS 3CO PLUS 8H PRIME POSITIVE EQUALS 2 CR PRIME3POSITIVE PLUS 3 CO SUB2 PLUS 4 H SUB2 O. THE KINETICS OF THIS REACTION IN AQ. SOLNS. OF H SUB2 SO SUB4 WAS STUDIED; AR DILD. CO WAS USED, H SUB2 (PDCL SUB4) SERVED AS A CATALYST, AND THE RATES WERE FOLLOWED POTENTIOMETRICALLY. RESULTS REVEALED AN ANOMALOUS DEPENDENCE OF THE DIMENSIONLESS D. OF THE GAS STREAM ON THE DIMENSIONLESS CRITERION OF HATTA, WHEN THE TEMP. AND THE AMT. OF CATALYST WERE CHANGED. THEORETICAL ANAL. WAS ATTEMPTED, RESULTS JUSTIFIED THE ADOPTION OF THE FILM THEORY OF ABSORPTION. EQUATIONS WERE DEVELOPED TO DET. THE CONCN. OF THE GAS COMPONENT ALONG THE VERTICAL AXIS OF THE REACTOR. THE PROCEDURE IS BASED ON THE COMPARISON OF THE POTENTIAL OF A PT ELECTRODE AT A GIVEN DEPTH WITH THE VALUE OF THE HATTA NO. FACILITY: KAZ. GOS. UNIV. IM. KIROVA, ALMA-ATA, USSR.

UNCLASSIFIED

USSR UDC 615.28:547.789.6

RUDZIT, E. A., LUK'YANOV, A. V., VORONIN, V. G., KULIKOVA, D. A., and RADKEVICH, T. P., All Union Scientific Chemical Pharmaceutical Research Institute imeni S. Ordzhonikidze, Moscow

"Antimicrobial Activity of Benzothiazolequinones"

Moscow, Farmakologiya i Toksikologiya, Vol 34, No 3, May-Jun 71, pp 350-352

Abstract: Antimicrobial activity of 2-substituted 4-dialkylaminobenzothiazolequinones-6,7, 6-hydroxybenzothiazolequinones-4,7, and 2-substituted-6-hydroxy(methoxy)-benzothiazoles was studied. It was determined that none of the 2-substituted 5-hydroxy(methoxy)benzothiazoles, 6-hydroxybenzothiazolequinones-4,7, nor their 5-halo or 5-piperidinomethyl substituted analogs possessed any antimicrobial activity. Only the benzothiazolequinones-6,7 with nitrogen-containing substituents in positions 2 and 4 showed bacteriostatic (including tuberculostatic) and some mycostatic activity.

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UDC 615.28:547.567.012

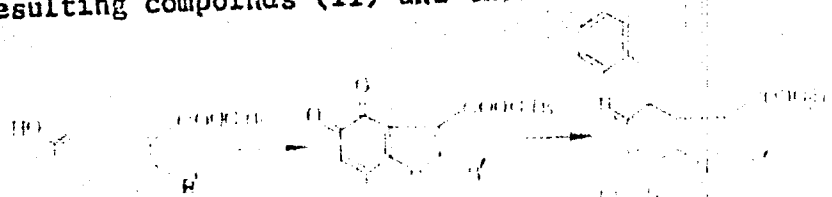
USSR

LUK'YANOV, A. V., RUDZIT, E. A., ALESHINA, V. A., VORONIN, V. G., RADKEVICH, T. P., KULIKOVA, D. A., LISITSA, L. I., and TSIZIN, YU. S., All-Union Scientific Research Chemics Pharmaceutical Institute imeni Sergo Ordzhonikidze, Moscow, Ministry of Health USSR

"Study of Heterocyclic Quinones. XV. Synthesis and Antimicrobial Action of Substituted Indolequinones-4,5"

Moscow, Khimiko-Farmatsevticheskiy Zhurnal, Vol 4, No 7, 1970,

Abstract: In earlier reports the authors showed that several heterocyclic quinones can be obtained by oxidation of the corresponding phenols with oxygen in the presence of a Cu^{2+}-secondary amine complex. The present report describes the use of this method for oxidation of 5-oxyindoles (I) and the study of the structures of the resulting compoinds (II) and their antimicrobial action.



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LUK'YANOV, A. V., et al., Khimiko-Farmatsevticheskiy Zhurnal, Vol 4, No 7, 1970, pp 16-20

a) CH_3 b) C_6H_5 c) o-$CH_3C_6H_4$ d) p-$CH_3OC_6H_4$ e) p-ClC_6H_4
f) m-$C_2H_5OC_6H_4$ R' CH_3 (a-f) g) R' R' C_6H_5

It was established that all compounds tested are inactive toward tuberculosis bacillus, gram-negative bacteria, and fungi. Of correlations existing between structure and action, the following were noteworthy: 1) all tested 5-oxyderivatives of 2-methyl(or phenyl) -3-carboethoxyindole (Ia-I) do not suppress bacterial growth. 2) Antibacterial activity toward gram-positive microorganisms is exhibited by 2-methyl-3-carboethoxy-7-piperdinoindolequinones-4,5 containing an aryl substituent at N_1 (IIb-IIf). 3) Phenazine derivatives (IIIa-IIIf) of o-quinones (IIa-IIf) do not exhibit anti bacterial action. Results of this study show the value of searching for new antibacterial preparations among the new series of o-quinones of 2-methyl-3-carboethoxy-7-piperidinoindole.

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1/2 013 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--HETEROCYCLIC QUINONES. ANIMATION OF 6,HYDROXYBENZOTHIAZOLE DURING OXIDATION -U-
AUTHOR-(03)-LUKYANOV, A.V., VORONIN, V.G., TSIZIN, YU.S.

COUNTRY OF INFO--USSR

SOURCE--ZH. VSES. KHIM. OBSHCHEST. 1970, 15(2), 238-9

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--HETEROCYCLIC BASE COMPOUND, QUINONE, HYDROXYL RADICAL, THIAZOLE, OXIDATION, AMINE, MORPHOLINE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/1060 STEP NO--UR/0063/70/015/002/0238/0239

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2/2 013 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AP0128487
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AGITATING 0.5 G CU(OAC) SUB2 IN 100 ML MEOH AND 0.4 MOLE R SUB2 NH WITH 15.1 G APPROPRIATE 6,HYDROXYBENZOTHIAZOLE IN 0 ATM. AT 20DEGREES RESULTED IN AN EXOTHERMIC REACTION (TO 35-40DEGREES) WHICH TOOK UP SIMILAR TO 4.5 L. O AND GAVE THE FOLLOWING I (R SHOWN): PIPERIDINO, DECOMPD. 169.5-70DEGREES; NME SUB2, DECOMPD. 161.5-2.5DEGREES; AND MORPHOLINO, DECOMPD. 182-3.5DEGREES. IF THE STARTING BENZOTHIAZOLE CONTAINS AN ARYL GROUP IN THE 2 POSITION, THE ADDN. OF SECONDARY AMINES FAILED, POSSIBLY OWING TO STERIC FACTORS. THE REACTION OF ADDN. PUTATIVELY PASSES THROUGH II AS AN INTERMEDIATE. FACILITY: VSES. NAUCH. ISSLED. KHIM. FARM. INST. IM. ORDZHONIKIDZE, MOSCOW, USSR.

UNCLASSIFIED

USSR

GVOZDOVER, R. S., LUK'YANOV, A. YE., SPIVAK, G. V., RAU, E. I., BYKOV, M. V.

"Electron Microscopy of Periodic Piezoelectric Fields"

Moscow, Izvestiya Akademii Nauk, Seriya Fizicheskaya, Vol 34, No 7, 1970, pp 1483-1491

Abstract: This article discusses problems in the formation of the image field contrast varying periodically with time, computes the amplitudes of the piezoelectric fields producing the contrast on the screen of a mirror or raster electron microscope, and describes an experimental method for visualizing and measuring these piezoelectric fields. The piezoelectricity in question takes place on the surfaces of crystals under the action of ultrasonics, a phenomenon often investigated by electron microscopes stroboscopically operated. The results of experiments performed on crystals of quartz, lithium niobate -- $LiNbO_3$, and cadmium sulfide (CdS) are given and the ultrasonic delay lines from the quartz and $LiNbO_3$ crystals investigated. Gratitude is expressed to V. Ye. Lyamov for his useful comments on some of the results of the work.
1/1

USSR UDC 548.313.7

LUK'YANOV, D.P., PUPOV, A.D.

"Classification Of Electrooptical Media Satisfying The Operating Conditions In Systems For Shift Of The Light Wave Frequency"

Radiotekhnika i elektronika, Vol XVII, No 5, May 72, pp 1001-1009

Abstract: A classification is made of electrooptical media which provide uniform rotation of an ellipse originating at the cross section of the ellipsoid of the refractive indices with the plane of application of the circular controlling field. The analysis of the conditions for interaction of circular light and modulating waves in electrooptical media makes it possible to form a requirement on the polarization constants of crystals with which the frequency shift of the initial light wave is attained. The classification made of dielectrics enlarges the assortment of electooptical media which satisfy the conditions of operation of frequency-shift devices, single-band modulators and a number of other systems which use a circular wave for excitation of crystals with both a linear and a quadratic electroptical effect. 2 tab. 12 ref. Received by editors, 7 April 1971.

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USSR

UDC: 621.373.029.67.001.5

LUK'YANOV, D. P.

"Interaction of Arbitrarily Polarized Light Waves with a Circular Modulating Field in Cubic Crystals"

Moscow, Radiotekhnika i Elektronika, No 5, 1970, pp 1052-1058

Abstract: Earlier papers have shown that placing a cubic crystal in a uniform circularly polarized electric field results in the deformation of the refraction index ellipsoid and its rotation, and that a light wave passing through the crystal may interact with the modulating field to produce frequency shifts. Since such interaction may also produce highly efficient amplitude modulation, the author analyzes the transmission of the two waves through the crystal in more detail. On the basis of a spatial model, he derives two differential equations and by solving them obtains equations for the left and right circulating light waves. A final expression for the light wave is found which indicates that in the circular

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LUK'YANOV, D. P., Radiotekhnika i Elektronika, No 5, 1970, pp 1052-1058

modulating field, the light wave emerging from the crystal is divided into two circularly polarized waves with the sum and difference frequencies of the two original waves. The differential equations are generalized for an anisotropic medium, and some particular cases are examined. These include modulation by a uniform field, amplitude modulation, and nonreciprocal characteristics. The author expresses his gratitude to S. I. Bychkov and V. I. Zharikov.

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1/2 037 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--INTERACTION OF ARBITRARILY POLARIZED LIGHT WAVES WITH A CIRCULAR MODULATING FIELD IN CUBIC CRYSTALS -U-

AUTHOR--LUKYANOV, D.P.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, RADIOTEKHNIKA I ELEKTRONIKA, NO 5, 1970, PP 1052-1058

DATE PUBLISHED-------70

SUBJECT AREAS--NAVIGATION

TOPIC TAGS--LIGHT POLARIZATION, CIRCULAR POLARIZATION, CUBIC CRYSTAL, ELECTRIC FIELD, REFRACTIVE INDEX, FREQUENCY SHIFTING, AMPLITUDE MODULATION, DIFFERENTIAL EQUATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3005/0583 STEP NO--UR/0109/70/000/005/1052/1058

CIRC ACCESSION NO--AP0132751

UNCLASSIFIED

2/2 037 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0132751

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EARLIER PAPERS HAVE SHOWN THAT PLACING A CUBIC CRYSTAL IN A UNIFORM CIRCULARLY POLARIZED ELECTRIC FIELD RESULTS IN THE DEFORMATION OF THE REFRACTION INDEX ELLIPSOID AND ITS ROTATION, AND THAT A LIGHT WAVE PASSING THROUGH THE CRYSTAL MAY INTERACT WITH THE MODULATING FIELD TO PRODUCE FREQUENCY SHIFTS. SINCE SUCH INTERACTION MAY ALSO PRODUCE HIGHLY EFFICIENT AMPLITUDE MODULATION, THE AUTHOR ANALYZES THE TRANSMISSION OF THE TWO WAVES THROUGH THE CRYSTAL IN MORE DETAIL. ON THE BASIS OF A SPATIAL MODEL, HE DERIVES TWO DIFFERENTIAL EQUATIONS AND BY SOLVING THEM OBTAINS EQUATIONS FOR THE LEFT AND RIGHT CIRCULATING LIGHT WAVES. A FINAL EXPRESSION FOR THE LIGHT WAVE IS FOUND WHICH INDICATES THAT IN THE CIRCULAR MODULATING FIELD, THE LIGHT WAVE EMERGING FROM THE CRYSTAL IS DIVIDED INTO TWO CIRCULARLY POLARIZED WAVES WITH THE SUM AND DIFFERENCE FREQUENCIES OF THE TWO ORIGINAL WAVES. THE DIFFERENTIAL EQUATIONS ARE GENERALIZED FOR AN ANISOTROPIC MEDIUM, AND SOME PARTICULAR CASES ARE EXAMINED. THESE INCLUDE MODULATION BY A UNIFORM FIELD, AMPLITUDE MODULATION, AND NONRECIPROCAL CHARACTERISTICS.

UNCLASSIFIED

UDC 669.15

USSR

LUK'YANOVA, I. N., NEVZOROV, B. A., and STARKOV, O. V.

"Mechanical Properties of 1Kh16N15MZB and 1KH18N10T Austenitic Steels Carburized in Liquid Metal Sodium"

Moscow, Atomnaya Energiya, Vol 33, No 4, Oct 72, p 852

Abstract: Thin plates of 1Kh18N10T and 1Kh16N15MZB austenitic steels, which after carburization in sodium at 500-800°C for 1-100 hrs had a different content of C (from 0.1 to 1 wt %), were tested after carburization and also after isothermal aging in argon at 650°C for 500 and 1000 hrs. Their C-content dependent change of mechanical properties was determined by computing coefficients of a polynomial by the method of least squares for 30-45 experimental points. The ultimate strength was found to increase somewhat with increasing C-content, the yield limit increased with increasing C-content up to the value of ultimate strength, the microhardness increased during carburization from 250 kgf/mm^2 (initial steels) to 800 kgf/mm^2 (steels with 1 at wt% of C), and the specific elongation was found to be most sensitive to changes in C-content. Derived empirical functions characterizing the changes in ultimate strength and specific elongation make it possible not only to rate the mechanical properties by given C-content and the allowable C-content by the given complex of mechanical

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LUK'YANOVA, I. N., et al., Atomnaya Energiya, Vol 33, No 4, Oct 72, p 852

properties, but also to determine the susceptibility of mechanical properties of steels to the change in C-content during the carburization process in sodium. Nine formulas, two bibliographic references.

Acc. Nr: AP0035961 Ref. Code: UR 0069

PRIMARY SOURCE: Kolloidnyy Zhurnal, 1970, Vol 32, Nr 1, pp 67-73

INVESTIGATION OF THE COLLOID-CHEMICAL PROPERTIES OF CALCIUM HYDROSILICATES

COAGULATION STRUCTURES OF PRECIPITATED CALCIUM HYDROSILICATES

Luk'yanova, O. I.; Sun'Man'-Lin.

Summary

The kinetics of strengthening of the coagulation structures of precipitated hydrosilicates under the action of accumulative recrystallization have been studied. At a low rate recrystallization strengthens the coagulation structures, whereas at a high rate (in freshly-precipitated hydrosilicates) it has a dual effect. The dispersed structures of hydrosilicates (including those strengthened by recrystallization) are strengthened additionally during plastic deformation under the action of constant and increasing applied stresses.

D. n. 18

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REEL/FRAME

19720702

Coatings

UDC 669.293.84

USSR

ZEMSKOV, G. V., KOGAN, R. L., LUKYANOV, R. M., and LUKYANCHENKO, YE. M., Odessa

"Diffusion Surface Alloying of Niobium with Chromium, Titanium, and Silicon"

Moscow, Izvestiya Akademii Nauk SSSR -- Metally, No 5, 1970, pp 224-226

Abstract: This paper contains an investigation of the process of formation of coatings on VN-2 niobium alloy with diffusion saturation of it by chromium, titanium, and silicon. The diffusion surface alloying was performed in a mixture of powdered saturating elements with addition of a case-hardening element. The alloy was saturated simultaneously with chromium and titanium and then silicon. The process of diffusion surface alloying was studied at various temperatures (1,000-1,200°C) and various saturation periods (1-15 hours). The distribution of the saturating elements and niobium with respect to depth of the diffusion layers was studied by the methods of microstructural analysis, x-ray micrography, and microradiography.

During simultaneous diffusion of chromium, titanium, and silicon into VN-2 alloy, as a result of the mutual effect, variation of the depth of diffusion of the elements and also the nature of their distribution in a layer by

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ZEMSKOV, G. V., et al, Izvestiya Akademii Nauk SSSR -- Metally, No 5, 1970, pp 224-226

comparison with the single-component saturation process is observed. In the case of complex alloying of the surface of niobium alloys in order to obtain multicomponent phases in the coating, it is necessary to select the process parameters so as to insure identical depth of diffusion of the saturating elements. A figure is presented which illustrates the effect of the temperature and duration of the titanium-chromizing and siliconizing processes on the depth of diffusion of the alloying elements into the alloy. From this figure it is clear that increasing the titanium-chromizing process temperature is favorable since it effectively increases the depth of penetration of chromium into the diffusion layer.

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LUKYANOV, S.

Wednesday, March 22, 1972 3

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IMPORTANT CONTRIBUTION TO ATOMIC PHYSICS

Academician B.Kadomtsev and Professor S.Lukyanov

Atomic physics has largely determined the fast upswing of science in our time and helped to disclose the innermost mysteries of the structure of matter. But not all of them have been solved so far. And, no matter how paradoxal this may sound, among the "blank spots" of atomic physics there has for a long time been one of the most widespread phenomena--the collision of heavy atoms with moderate energies.

The cycle of research [illegible] elementary processes and [illegible] during atom collisions", performed by [illegible] Academician V.A.Belyayev, N.V.Fedorenko and O.B.Firsov at the Physical Engineering Institute of the USSR Academy of Sciences and the I.V.Kurchatov Institute of Atomic Energy, has been nominated for a 1972 Lenin Prize. This research has been developing under our very eyes throughout the past two decades. It has resulted in the establishment of a new independent sector of science--modern physics of atom collisions.

The first thing the researchers did was to elaborate experimental methods which allow to perform inelastic atom collisions and to study them in detail in laboratory conditions. In order to obtain precise quantitative data on the probability of various elementary processes that take place during such collisions, the scientists developed [illegible] the ingenious method of "trailing" beams was employed to investigate the delicate details of the scattering process with the [illegible] energies of colliding particles. Here a well-focused, intensive beam of fast particles of one type moved within a beam of particles of another type in a space that is matched with the former beam. The particle velocities of both beams almost coincide, and collisions between them take place only as a result of the low relative velocity of both beams.

These methods, finding further development in the research of several [illegible] scientists, are now widespread and generally accepted. True, some of them are unique and have not been mastered in other laboratories yet. They allow, for instance, to "weigh" one atom particle with the aid of

[illegible] Moskva, 9 Mar 72.